What is claimed is:

Sub A1

1. An optical isolator core comprising:

a first polarizer configured to receive incident light traveling along a path and refract said incident light into o-rays and e-rays;

a rotator disposed along said path and configured to rotate the polarization planes of said o-rays and e-rays;

a second polarizer disposed along said path and having an optic axis approximately 45° apart from said first polarizer and having a wedge cutting angle substantially the same as said first polarizer; and

a correction element of birefringent material having a length and an optic axis having a cutting angle, wherein said length and said optic axis angle are chosen to compensate for differential group delay and walk-off introduced by said first and second polarizers.

2. The isolator core of claim 1, wherein said first and said second polarizers each have approximately the same wedge angle.

3. The isolator core of claim 2, wherein said first polarizer has an optic axis angle of approximately +/- 45°.

4. The isolator core of claim 3, wherein said second polarizer has an optic angle of approximately 0° or 90°.

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5. The optical isolator of claim 1, wherein a distance traveled by said o-rays and said e-rays through said correction element is equal to said length of the correction element multiplied by the tangent of said predetermined angle.

6. The optical isolator of claim 1, wherein said correction element further includes an optical plane in which said o-rays and said e-rays travel, wherein said optical plane is aligned with or perpendicular to said optic axis of said second polarizer.

7. The optical isolator of claim 1, wherein said correction element comprises a single piece of material.

8. The optical isolator of claim 1, wherein said correction element is configured such that said e- and o-rays are refracted such that said e- and o- rays intersect at a point proximate to a distal face of said correction element.

9. An optical isolator adapted for receiving light transmitted through the isolator in a forward direction comprising:

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a first polarizer configured to separate light incident in the forward direction into at least one o-ray and at least one e-ray;

a polarization rotator;

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a second polarizer; and

a correction element having a crystal optic axis which lies in a plane defined by said at least one e-ray and said at least one o-ray.

10. The optical isolator of claim 9 wherein said at least one o-ray and said at least one e-ray travel through said isolator separated by a walk-off distance and said correction element is configured to substantially eliminate said walk-off distance between said at least one o-ray and said e-ray exiting said second polarizer.

11. The optical isolator of claim 9 wherein said correction element is configured to substantially eliminate differential group delay.

12. The optical isolator of claim 9 wherein said first polarizer has a crystal optic axis angle of approximately +/- 45°.

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13. The optical isolator of claim 9 wherein said second polarizer has a crystal optic axis angle of approximately 0° or 90°.

14. The optical isolator of claim 13 wherein said correction element has a crystal optic axis α which lies with the plane defined by said at least one o-ray and said at least one e-ray.

15. The optical isolator of claim 9 wherein said correction element has a length L and a crystal optic axis angle α which are selected such that said at least one e-ray is

refracted by said correction element such that the respective light paths of said e- and o-rays intersect at a location proximate to a face of said correction element.

16. The optical isolator of claim 15 wherein said o-rays and said e-rays are refracted by said correction element.

17. The optical isolator of claim 15 wherein said at least one o-ray and said at least one e-ray intersect at an angle β.

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18. The optical isolator of claim 15 wherein said at least one o-ray and said at least one e-ray exit said second polarizer separated by a walk-off distance which is approximately equal to said length L of the correction element multiplied by the tangent of angle β.

19. The optical isolator of claim 18 wherein said tangent of angle β is defined as :

$$\tan(\beta) = \frac{(n_e^2 - n_o^2)\sin(\alpha)\cos(\alpha)}{n_o^2 \sin^2\alpha + n_e^2 \cos^2\alpha}$$

20. The optical isolator of claim 9, wherein said first and second polarizers comprise birefringent material.

21. The optical isolator of claim 9, wherein said first polarizer, said polarization rotator, said second polarizer, and said correction element are arranged in a sequence along an axis of said isolator.

22. An optical isolator adapted for receiving light transmitted through the isolator on a forward direction comprising:

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a first polarizer configured to separate light incident in the forward direction into at least one o-ray and at least one e-ray;

a polarization rotator;

a second polarizer configured to refract at said at least one o-ray and at least one e-ray exit such that they exit said second polarizer in substantially parallel light paths separated by a walk-off distance; and

a correction element having a length and a crystal optic axis which lies in a plane defined by said at least one o-ray and at least one e-ray, and wherein at least one of said at least one o-ray and at least one e-ray exiting said second polarizer are refracted by said correction element such that their respective light paths intersect at an angle β.

23. The optical isolator of claim 22 wherein said correction element is configured to substantially eliminate said walk-off distance between said at least one o-ray and at least one e-ray exiting said second polarizer.

24. The optical isolator of claim 22 wherein said correction element is configured to substantially eliminate differential group delay.

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25. The optical isolator of claim 22 wherein said first polarizer has a crystal optic axis angle of approximately +/- 45° relative to a beveled of said first polarizer.

26. The optical isolator of claim 22 wherein said second polarizer has a crystal optic axis angle of approximately 0° or 90° relative to a beveled of said second polarizer.

27. The optical isolator of claim 22 wherein said polarization rotator comprises a 45° Faraday rotator.

28. The optical isolator of claim 22 wherein said correction element has a length L and a crystal optic axis cutting angle α which are selected such that said at least one o-ray or said at least one e-ray are refracted by said correction element such that their respective light paths intersect at a location proximate to a face of said correction element .

29. The optical isolator of claim 22 wherein ~~both~~ of said at least one o-ray or said at least one e-ray are refracted by said correction element .

30. The optical isolator of claim 22 wherein said at least one o-ray and said at least one e-ray intersect at an angle β.

31. The optical isolator of claim 30 wherein said at least one o-ray and said at least one e-ray exit said second polarizer separated by a walk-off distance which is approximately equal to said length L multiplied by the tangent of angle β.

32. The optical isolator of claim 31 wherein said tangent of angle β is defined as :

$$\tan(\beta) = \frac{\left(n_e^2 - n_o^2\right)\sin(\alpha)\cos(\alpha)}{n_o^2 \sin^2\alpha + n_e^2 \cos^2\alpha}$$

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33. The optical isolator of claim 22, wherein said first and second polarizers comprise birefringent material.

34. The optical isolator of claim 22, wherein said first polarizer, said polarization rotator, said second polarizer, and said correction element are arranged in a sequence along an axis of said isolator.

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35. A method for receiving light passing through an optical isolator in a forward direction through the isolator comprising:

separating the light traveling in a forward direction into at least one o-ray and said at least one e-ray;

rotating the polarization of said at least one o-ray and said at least one e-ray;

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refracting said at least one o-ray and said at least one e-ray such that they are in substantially parallel paths; and

passing said at least one o-ray and said at least one e-ray through a correction element having an optic axis in a plane defined by said substantially parallel path at least one o-ray and said at least one e-ray exiting said second polarizer.

36. The method of claim 35 wherein said correction element is configured to substantially eliminate said walk-off distance between said at least one o-ray and at least one e-ray exiting said second polarizer.

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37. The method of claim 35 wherein said correction element is configured to substantially eliminate the first order polarization mode dispersion, namely DGD.

38. The method of claim 35 wherein said correction element has a length L and a crystal optic axis cutting angle α which are selected such that said at least one o-ray and said at least one e-ray are refracted by said correction element such that their respective light paths intersect at a location proximate to a face of said correction element.

39. The method of claim 38 wherein said at least one o-ray and said at least one e-ray exit separated by a walk-off distance which is approximately equal to said length L multiplied by the tangent of angle β.

40. The method of claim 39 wherein said tangent of angle β is defined as :

$$\tan(\beta)=\frac{\left(n_e^2-n_o^2\right)\sin(\alpha)\cos(\alpha)}{n_o^2\sin^2\alpha+n_e^2\cos^2\alpha}$$

41. An optical isolator comprising:

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means for separating light traveling in a forward direction into at least one o-ray and said at least one e-ray;

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means for rotating the polarization of said at least one o-ray and said at least one e-ray;

means for refracting said at least one o-ray and said at least one e-ray such that they are in substantially parallel paths; and

end

means for passing said at least one o-ray and said at least one e-ray through a correction element having an optic axis in a plane defined by said substantially parallel at least one o-ray and said at least one e-ray exiting said second polarizer.

42. The optical isolator of claim 41 wherein said correction element is configured to substantially eliminate said walk-off distance between said at least one o-ray and at least one e-ray exiting said second polarizer.

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43. The optical isolator of claim 41 wherein said correction element is configured to substantially eliminate the first order polarization mode dispersion, namely DGD.

44. The optical isolator of claim 41 wherein said correction element has a length L and a crystal optic axis cutting angle α which are selected such that said at least one o-ray and said at least one e-ray are refracted by said correction element such that their respective light paths intersect at a location proximate to a face of said correction element .

45. The optical isolator of claim 44 wherein said at least one o-ray and said at least one e-ray exit separated by a walk-off distance which is approximately equal to said length L multiplied by the tangent of angle β.

46. The optical isolator of claim 45 wherein said tangent of angle β is defined as :

$$\tan(\beta) = \frac{\left(n_e^2 - n_o^2\right)\sin(\alpha)\cos(\alpha)}{n_o^2 \sin^2 \alpha + n_e^2 \cos^2 \alpha}$$

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